

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

ORDER NO. 00-029

NPDES PERMIT NO. CA0038059

REISSUING WASTE DISCHARGE REQUIREMENTS FOR:

AQUIFER RECLAMATION/SALINITY BARRIER WELLS
AND DESALINATION FACILITY
ALAMEDA COUNTY WATER DISTRICT
FREMONT AND NEWARK, ALAMEDA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, (hereinafter the Board) finds that:

1. Alameda County Water District, hereinafter The District, by application dated July 12, 1999, has applied for reissuance of waste discharge requirements and a permit to discharge wastewater under the National Pollutant Discharge Elimination System (NPDES).
2. The District operates a series of wells along the southeast side of San Francisco Bay to prevent the movement of groundwater with high total dissolved solids (TDS) toward the District's primary potable water well fields (Mowry Wellfield and Peralta-Tyson Wellfield) near Niles Canyon and part of the Niles Cone Groundwater Basin. Historically, up to 30 million gallons per day (mgd) of extracted brackish water has been pumped from a total of 14 wells in the Fremont-Newark area to flood control channels maintained by the Alameda County Flood Control and Water Conservation District (ACFCWCD).
3. Nine wells are part of the District's Aquifer Reclamation Program (ARP), and were installed approximately 25 years ago. The District has used the ARP wells to pump brackish water from the aquifers that lie 45-400 feet below sea level to induce the flow of higher quality potable groundwater from recharge areas that lie to the east westward toward the Bay. The nine ARP wells discharge into a ACFCWCD flood control channel at six locations via Lines F, I, B, and D. The channels are generally freshwater environments whose vegetation is frequently managed by mechanical or herbicidal means. Each well has a capacity of approximately 2000 gpm. Six of the ARP wells combine in pairs (Willowood 1 and 2, Cedar 1 and 2, and Darvon 1 and 2) hence the total of six versus nine ARP discharge sites.
4. In addition to the ARP well program, the District has partially implemented a Salinity Barrier Project (SBP). Five wells (of the originally proposed fourteen) were installed in a roughly linear liner closer to the bay shoreline. Pumping of the wells helped form a barrier to further brackish water intrusion into the aquifer. These wells were operated in conjunction with the ARP well program. However, in recent years, the removal efficiency of the SBP wells has been reduced, and the program is currently being reassessed by the District. The ARP and SBP well site names and effluent stream numbers are continued from the current permit and are shown on the map and table appended as ATTACHMENT A, hereinafter a part of this Order.
5. The Willowood 1 and 2 and Cedar 1 and 2 wells discharge to ACFCWCD Line F north of Cedar Boulevard (see map). Line F is a trapezoid channel with periodic riprap or cement

aprons at roadway crossings that drains developed industrial areas along Central Avenue, and discharges to the unlined channel of Plummer Creek near the terminus of Willow Avenue. From this point the creek can be characterized as an unlined slough channel defined by levees associated with the salt evaporation ponds operated by Cargill. Plummer Creek discharges to Newark Slough just above its confluence with San Francisco Bay.

6. The Darvon 1 and 2 wells discharge to ACFCWCD flood control channel Line I (see map), a trapezoid channel providing drainage for developed residential areas along the Thornton Avenue corridor north of Sycamore Avenue. Line I discharges to the main channel of Newark Slough at Thornton Avenue through four 48-inch Waterman tidal gates. Newark Slough meanders west to San Francisco Bay in a narrow corridor defined by State Route 84 to the north and a network of diked commercial salt ponds to the south.
7. The Farwell and Bellflower wells discharge to ACFCWCD flood control channel Lines D and B, respectively. Both of these channels are tributary to Mowry Slough. From their discharge locations, each of these channels is a trapezoid flood control channel, with periodic riprap or cement aprons at roadway crossings. Line B follows Mowry Avenue and transitions to a natural channel defined by dikes along the eastern edge of the Cargill salt ponds. Line D drains areas further southeast, and merges with Line B just east of Mowry Avenue. From this intersection, Mowry Slough meanders west to San Francisco Bay with the main channel confined by the diked salt evaporation ponds operated by Cargill.
8. The amount pumped from each well can vary considerably from month to month and year to year depending on the District's groundwater basin management needs. The amount of pumping depends on the amount of recharge at the Alameda Creek infiltration basins, pumping at the Peralta-Tyson and Mowry Well fields and groundwater elevation at the ARP wells. Typically, the ARP wells are pumped significantly during the winter months except during storm periods when there may be significant flow in the channels. During the summer months, or during extended periods of drought, many of the ARP wells are not operated. Annual flows from 1994-1998 averaged about 7,700 acre feet per year (AFY), with a range from 3,800 ac-ft. to 16,000 ac-ft. Seasonal flows (April to September) averaged about 4,300 ac-ft. Historically, annual flows have reached as high as 33,600 ac-ft.
9. Water quality varies moderately by well. The 1994-1998 annual average TDS concentrations ranged from 1060 to 2900 mg/L. Average hardness during 1997 ranged from 430 mg/L to 1570 mg/L. The levels of other trace elements present are generally within the ranges expected from South Bay geological conditions. Without desalination, the ARP well water is not suitable for potable use or for irrigation given the elevated salinity and hardness levels.
10. The District completed an Integrated Resource Plan (IRP) in 1995 that contains a long range program for conservation, water supply, and water quality management to meet the existing and future demands within the District's service area through the year 2030. Near term, the District has need for an additional low TDS water supply to meet projected demand, improve delivered water quality, and reduce reliance on imported supply. After evaluating and comparing alternative resource sequences, a mix of conservation, operational alternatives, and new supplies, it was determined that a new brackish water Desalination Facility would best meet the District's policy objectives.
11. Based on the IRP, the District proposes to construct initially a 5 mgd and ultimately a 10 mgd reverse osmosis (RO) desalination facility, to produce a low TDS potable water supply from high TDS groundwater. The District proposes to reroute designated ARP wells to the

Desalination Facility to provide a composite feedwater source, recover supplies for potable use through reverse osmosis treatment, and return concentrate generated by this process to local flood control channels, consistent with existing ARP well operations.

12. The Desalination Facility project will provide several net environmental benefits. The existing ARP operation is currently operated as a salinity reduction and groundwater management project, and the proposed project has been designed for integration and consistency with the ARP operations. In addition to maintaining groundwater protection benefits, the Desalination Facility project, by converting the brackish unused water into potable supply, will reduce the need for exporting additional water out of the Delta. The demineralized groundwater, a local supply, will serve as a more 'drought proof' supply will increase the reliability of the District's potable water supply. The facility will improve overall the District's system seismic reliability since it will provide a permanent water supply source west of the Hayward fault. The low TDS water produced will also serve to maintain and enhance delivered water quality.
13. In addition to these groundwater quality and water supply benefits, the total mass of minerals and other constituents currently being discharged by the ARP wells to the flood control channels would be reduced by a minimum of 10 to 25 percent, and potentially up to 38%, due to the mass of constituents remaining in the permeate (i.e. drinking water) after RO treatment. {These are the averages of the removals for the individual constituents. 10% is removal at 95% rejection assuming mass of excess ARP blend water is included in calculation, 25% is removal looking at conditions when only concentrate and no excess blend water is being pumped, and 38% is concentrate only removal assuming membranes only reject 80% of metals (i.e. more go into permeate/drinking water instead of into Bay.)}
14. The Desalination Facility project has been developed by the District as part of its Integrated Resource Planning Process (IRP), with subsequent examination and approval in the *Integrated Resource Plan and 1996-2001 Capital Improvements Program EIR* (The District, 1998). With respect to the Desalination Facility project, the EIR examined the following:
 - Three alternative Desalination Facility sites within the City of Newark;
 - Alternative pipeline alignments from existing ARP wells to the Desalination Facility sites;
 - Existing characteristics and relative merits of discharging to flood control channels tributary to Newark Slough, Plummer, Creek, and Mowry Slough and
 - Three specific alternative discharge locations along Line F-1.
15. On August 27, 1998, the District's Board of Directors certified the Final EIR and approved the Capital Improvements Program, which includes implementation of the Desalination Facility at the Robertson Avenue site. This site is comprised of one parcel (APN 92A-2165-009) totaling 14.8 acres, and is currently vacant. The southeastern corner of this parcel, totaling approximately 5 acres, would be used for the proposed facility. This site will accommodate facilities to provide both the initial 5 mgd plant production capacity and future 10 mgd capacity expansion.
16. The proposed Desalination Facility would be integrated with existing ARP well operations, and project implementation would include installation of pipelines from two existing ARP well locations. This would route produced groundwater from three wells, (identified as Cedar 1, Cedar 2, and Bellflower) to the Desalination Facility site to provide a composite

feedwater source. The District's Darvon well may be used as an alternative to the Bellflower well, depending upon a final pipeline installation costs. As previously noted, ARP well pumpage from up to six wells to flood control channels tributary to Plummer Creek, Newark Slough, and Mowry Slough has averaged (1994-1998) about 7,700 AFY, with a range from 3,800 ac-ft. to 16,000 ac-ft. Seasonal flows (April to September) averaged about 4,300 ac-ft. Historically, annual flows have reached as high as 33,600 ac-ft. Actual pumpage is dependant upon the District's groundwater management practices in a given hydrologic year.

17. Under the proposed project, the District would likely operate the plant seasonally to augment their potable water supply and help meet peak summer demands. Assuming a 6 month seasonal operation, an estimated 4,500 act-ft. of 2600 mg/L TDS brackish groundwater would be pumped and routed to the Desalination Facility. Approximately 3,500 ac-ft. would be processed through the plant to produce 2,800 ac-ft of permeate. This would be blended with 320 ac-ft. of raw ARP water to produce 3,120 acre-feet of potable supply. The reverse osmosis process would result in a concentrate volume of approximately 700 ac-ft. When ARP well flows in excess of Desalination Facility demands are available, up to 700 ac-ft. of the composite ARP feedwater would be pumped providing a 1:1 blending ratio with the RO concentrate.
18. In order to identify design and operational parameters for the Desalination Facility, the District operated a 20 gpm desalination pilot plant with a configuration similar to the proposed full size facility from October 1998 until January 1999 at the Cedar 2 well site. Cedar 2 well pumps 1500 gpm from the Newark aquifer, which is the shallowest of the three aquifers used for ARP pumping and historically has had the highest TDS concentrations. Regional Board staff reviewed and approved the District's pilot plant study plan including use of small amounts of antiscalant (approved by the National Sanitation Foundation (FSF) for potable supply use) and sulfuric acid for feedwater pH control as required to protect the reverse osmosis membranes from mineral scaling. Results of the pilot plant study and subsequent technical studies were used to develop the project as currently proposed, and to identify quality parameters of the concentrate proposed for discharge.
19. The pilot plant results generally confirmed expectations about membrane performance and concentrate quality. Acute toxicity testing was conducted to document that the pilot plant concentrate discharge would comply with the District's existing NPDES permit requirements. The existing permit regulates the ARP system via effluent limitations on acute toxicity. Historically, the ARP wells have achieved greater than 90% survival, in compliance with NPDES permit limits. Acute toxicity 96-hour static renewal testing using three-spined stickleback showed 100% survival in the ARP well/pilot plant discharge when operated at 75% recovery. Testing of 100% concentrate from operation at both 50% and the maximum potential full-scale recovery rate of 85% also showed 100% survival.
20. The District evaluated permeate and concentrate quality that would be produced by a full-scale 5 mgd facility in a technical memorandum dated January 31, 2000. RO concentrate quality is determined by several factors including feed water quality, ion rejection of the membranes, and system feed water recovery. *Recovery* is defined as the ratio of flow passing through the membranes (permeate) to feedwater flow, and membrane *rejection* is defined as the ratio of mass removed to mass fed to the system. The evaluation assumed use of the Cedar 2 well, which has historically had the highest mineral and trace element concentrations, 80% permeate recovery, and a conservative 95% trace element membrane rejection (versus the 50-80% rejection measured in the pilot testing). Given these

conservative assumptions, it was concluded that there would be an equivalent absence of acute toxicity in concentrate or blended concentrate from a full-scale RO facility. The analysis also concluded that under all operating conditions, unblended concentrate quality would be protective of beneficial uses as compared with Freshwater Quality Objectives calculated per the 1995 Basin Plan at a conservative ambient hardness of 400 mg/L. Hardness in ARP wells contributing to Line F, a primary source of flow, ranged from 430 mg/L to 1580 mg/L. As per EPA guidance identified in the proposed California Toxics Rule preamble, hardness was limited to 400 mg/L for calculation of Freshwater Quality Objectives.

21. Based on the pilot study results and subsequent technical analyses, an 80 percent recovery RO system has been proposed for the initial 5 mgd desalination facility that would use three of the District's highest TDS ARP wells as the feedwater source: Cedar 1, Cedar 2, and Bellflower. At initial maximum capacity, approximately 7.5 mgd would be pumped from the three wells, with 6.25 mgd processed by the RO system. This would generate about 5 mgd of potable supply and 1.25 mgd of approximately 12,600 mg/L TDS concentrate with a pH of 7.1. The concentrate would be combined with up to 1.25 mgd of excess ARP well pumpage, when it is available, to yield a 1:1 blended TDS level of 7,600 mg/L. As with the pilot system, small amounts of sulfuric acid and NSF approved antiscalant would be added to the RO feedwater to control formation of mineral scale on the RO membranes.
22. Given the above evaluation of concentrate quality acceptability, investigations of local flood control channels were conducted to identify the best apparent discharge location. Analyses included receiving water quality sampling for TDS and trace metals, and vegetative biotic surveys. Based upon these investigations, a discharge to ACFCWCD Line F at its intersection with Central Avenue was identified as the best apparent discharge location. A 16-inch pipeline would be constructed within existing roadways or other rights of way from the Robertson Avenue desalination facility site to this location, located approximately 3,000 feet to the south. The District would connect this pipeline to an existing stormdrain that discharges to a concrete lined section of Line F from the southwest.
23. This location along Line F is a freshwater environment (~1.7 ppt salinity) not under tidal influence, and is vegetated with predominantly freshwater weedy species providing low habitat value. Essentially identical channel configuration and low value freshwater habitat exist upstream at the locations where the Cedar 1 and 2 wells currently discharge and may discharge in the future when the Desalination Facility does not need to be operated. The Willowood 1 and 2 wells, located further upstream from the Cedar wells, are responsible for the majority of water present in Line F during dry weather months. The freshwater environment transitions to more dominant salt tolerant species in the lower reach of Line F, just above a box culvert at the terminus of Willow Avenue that limits further upstream tidal influence. No sensitive species were identified as inhabiting Line F.
24. Line F is assessed on an annual basis by ACFCWCD for vegetation control, and both vegetative mowing and herbicide control measures are used to control excessive growth within the channel. Salt marsh vegetative communities providing sensitive species habitat are located downstream of Line F within Plummer Creek. The discharge of concentrate to Line F would likely improve the transition from freshwater to brackish water habitat within Line F, and is not anticipated to affect the distribution of salt tolerant species further downstream within Plummer Creek. The California Department of Fish and Game (Department) by letter dated November 1, 1999, did not object to the Line F discharge location and concurred with the above conclusions. They stated that "discharge at this

location could actually improve the transition from freshwater to brackish water habitats downstream in spite of periodic flood control maintenance activities." The Department further concluded that "the discharge should not adversely affect species identified as threatened or endangered under the California Endangered Species Act".

25. The District met with representatives of the US Fish and Wildlife Service (FWS) on November 2, 1999 to explain the proposed modified mode of ARP system operation with the desalination facility. The District responded by letter dated November 15, 1999 and February 14, 2000 to a request by FWS for additional documentation that the project would not result in adverse impacts on sensitive species and salt marsh habitat in the downstream reaches of Plummer Creek. Subsequent FWS comments have requested a confirmation spring survey be performed at the Robertson Avenue Site, and will be addressed by the District.
26. The attached Self-Monitoring Program requires the District to conduct a special water quality monitoring program during the first year following Desalination Facility startup to document that concentrate quality and ambient water quality in Line F and Plummer Creek are not significantly different from the levels predicted based on pilot plant results and as measured in predischARGE receiving water quality monitoring. If the first year special study results confirm no statistically significant differences between the observed and the projected water quality concentrations that were previously shown to be protective of beneficial uses, the Executive Officer may suspend additional receiving water monitoring unless and until there is evidence from on-going discharge monitoring that concentrate quality has significantly changed. Prior to startup the District will also prepare an Operations Plan to document adequacy and reliability of the Desalination Facility and an ARP well and concentrate monitoring plan to document feed and concentrate quality and volume of extracted demineralized groundwater recovered for potable use.
27. Alternative concentrate management methodologies to the flood control channel discharge were also investigated, including advanced treatment prior to channel discharge, discharge to the Union Sanitary District (USD) sewer collection system with and without advanced treatment, and direct pipeline connection to the East Bay Dischargers' interceptor downstream of USD. All involved significant capital and/or connection fee costs and significant annual O&M costs.
28. Diversion or additional treatment of the concentrate stream would raise the price of the RO water produced to the point where it would not be economical for the District to pursue the proposed ARP well demineralization project as a new source of supply. Given that the discharge to Line F would be protective of beneficial uses as described in the above Findings, the other alternatives do not appear warranted. If the proposed desalination plant were not implemented, the environmental and societal benefits identified above would not be achieved. Based on these findings, imposition of other concentrate management options appears to exceed the threshold of an "inordinate burden relative to the beneficial uses protected" per the Basin Plan Discharge Prohibition Exception to discharge to the receiving waters where the discharge will receive less than 10:1 dilution.
29. The ARP and SBP well system discharges are presently subject to NPDES Permit No. CA0038059 (Order No. 95-029, adopted February 15, 1995) that allows discharge into San Francisco Bay.
30. The Board adopted a revised Water Quality Control Plan for the San Francisco Basin (Basin Plan) on June 21, 1995. This updated and consolidated plan represents the Board's master

water quality control planning document. The revised Basin Plan was approved by the State Water Resources Control Board (State Board) and the Office of Administrative Law on July 20 and November 13, 1995, respectively. The Basin Plan identifies beneficial uses and water quality objectives for surface and groundwater in the region, as well as effluent limitations and discharge prohibitions intended to protect beneficial uses. This Order implements the plans, policies and provisions of the Board's Basin Plan.

31. Effluent limitations in this permit are based on the prior permit plus plans, policies, and water quality criteria of the Basin Plan, *Quality Criteria for Water* (EPA/5-86-001, 1986; Gold Book), applicable Federal Regulations (40 CFR Parts 122 and 131), and Best Professional Judgement.
32. The beneficial uses of South San Francisco Bay and contiguous water bodies include:
 - Industrial Service Supply
 - Navigation
 - Water Contact Recreation
 - Non-contact Water Recreation
 - Ocean Commercial and Sport Fishing
 - Wildlife Habitat
 - Preservation of Rare and Endangered Species
 - Fish Migration
 - Fish Spawning
 - Shellfish Harvesting
 - Estuarine Habitat
33. As described in the above findings, the ARP wells discharge to the upstream, freshwater portions of ACFCWCD flood control channels Lines F, I, B, and D that are tributary to Plummer Creek, Newark Slough, and Mowry Slough, respectively and which in turn are tributary to South San Francisco Bay. Discharge is to freshwater portions of the channels, which are subjected to periodic vegetation control and maintenance. The Basin Plan has not yet established beneficial uses specific for these tributaries. Board policy has been to use the tributary rule to interpret which beneficial uses are currently or potentially supported where beneficial uses have not been specifically designated. The Basin Plan states that in some cases a beneficial use may not be applicable to the entire body of water and that in these cases the Regional Board's judgement regarding water quality control measures necessary to protect beneficial uses will be applied.
34. The Basin Plan contains a prohibition of discharge of any wastewater which has particular constituents of concern to beneficial uses at any point at which the wastewater does not receive a minimum initial dilution of at least 10:1, or into any non-tidal water, dead-end slough, similar confined waters, or immediate tributaries thereof, or to San Francisco Bay south of the Dumbarton Bridge. As the Regional Board stated in prior Orders, and reaffirms herein, the ARP and SBP well discharges to the flood control channels comply with these three prohibitions because the groundwater discharges do not contain "particular characteristics of concern" to beneficial uses.
35. Regional Board staff review of the District's Technical Memorandum of January 31, 2000 titled "ACWD's Proposed Brackish Water Reverse Osmosis System – Evaluation of Alternative Concentrate Discharge Locations and Concentrate Management Options" and related information indicates that the proposed mode of ARP system operation with the

desalination facility is also consistent with Basin Plan exception criteria to the discharge prohibitions since the modified ARP system operation including the desalination facility will:

- Provide net environmental benefits through protection and desalination of the brackish groundwater basin and production of a new potable water supply;
 - Provide an equivalent level of environmental protection since there will be no new constituents of concern introduced and the mass of trace elements discharged will be reduced by a minimum of 10-25%, to possibly up to 38% from current conditions;
 - Be part of a reclamation project though salinity control and recovery of an otherwise wasted resource; and
 - Result in an inordinate burden relative to beneficial uses protected if the District were required to implement alternative concentrate treatment and/or disposal measures since such measures would at least double the cost of the desalination project and the potable water produced, and render the desalination project cost prohibitive relative to importing new sources of supply.
36. This Order serves as an NPDES permit, issuance of which is exempt from the provisions of Chapter 3 (commencing with Section 2100 of Division 13) of the Public Resources Code (CEQA) pursuant to Section 13389 of the Water Code.
37. The dischargers and interested agencies and persons have been notified of the Board's intent to reissue requirements for the existing ARP/SBP well discharges and modified ARP system operation with partial demineralization discharges and have been provided an opportunity to submit their written views and recommendations.
38. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to the provisions of Division 7 of the California Water Code and regulations adopted thereunder, and to the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, that the Alameda County Water District shall comply with the following:

A. DISCHARGE PROHIBITIONS

1. The discharge of effluents other than described in this Order is prohibited.

B. EFFLUENT LIMITATIONS

1. The survival of organisms in final desalination facility effluent or undiluted ARP/SBP well effluent shall be an eleven (11) sample median value of not less than 90 percent survival, and an eleven (11) sample 90 percentile value of not less than 70 percent survival. The eleven sample median and 90th percentile effluent limitations are defined as follows:

11 sample median: Any bioassay test showing survival of 90 percent or greater is not a violation of this limit. A bioassay test showing survival of less than 90 percent represents a violation of this effluent limit, if five or more of the past ten or less bioassay tests show less than 90 percent survival.

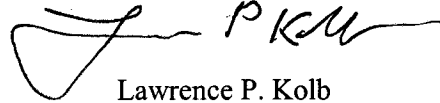
C. RECEIVING WATER LIMITATIONS

- 9

D. PROVISIONS

1. The requirements prescribed by this Order supersede the requirements prescribed by Order No. 95-029. Order No. 95-029 is hereby rescinded.
2. The District shall comply with all sections of this Order immediately upon adoption.
3. Compliance with Acute Toxicity Effluent Limitation
 - a. Compliance with Effluent Limitation B.4 (Acute Toxicity) of this Order shall be evaluated by measuring survival of test organisms acceptable to the Executive Officer exposed to final desalination facility effluent or undiluted ARP/SBP well effluent for 96 hours in static renewal bioassays.
 - b. All bioassays shall be performed according to protocols approved by the USEPA or State Board, or published by the American Society for Testing and Materials (ASTM) or American Public Health Association, or as directed by the Executive Officer. The discharger is allowed to continue using current test protocols until further guidance is provided by SWRCB or Board staff on conducting the new tests and interpreting the compliance results compared to current test results.
4. The District shall comply with the **Self-Monitoring Program** for this order, as adopted by the Board and as may be amended by the Executive Officer.
5. The District shall comply with all applicable items of the attached "**Standard Provisions and Reporting Requirements**" dated August 1993 (except section B - Stormwater and C - Sludge Monitoring and Reporting), or any amendments thereafter.
6. The Board may modify, or revoke and reissue, this Order and Permit if present or future investigations demonstrate that the discharge governed by this Order is causing or significantly contributing to adverse impacts on water quality and/or beneficial uses of the receiving waters.
7. This Order expires on April 19, 2005. The discharges must file a report of waste discharge in accordance with Title 23, Chapter 3, Subchapter 9 of the California Administrative Code not later than 180 days before this expiration date as application for reissuance of waste discharge requirements.
8. This Order shall serve as a National Pollutant Discharge Elimination System (NPDES) permit pursuant to Section 402 of the Clean Water Act or amendments thereto, and shall become on the date of its adoption provided the Regional Administrator, EPA, has no objection. If the Regional Administrator objects to its issuance, the permit shall not become effective until such objection is withdrawn.

I, Lawrence P. Kolb, Acting Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on April 19, 2000.

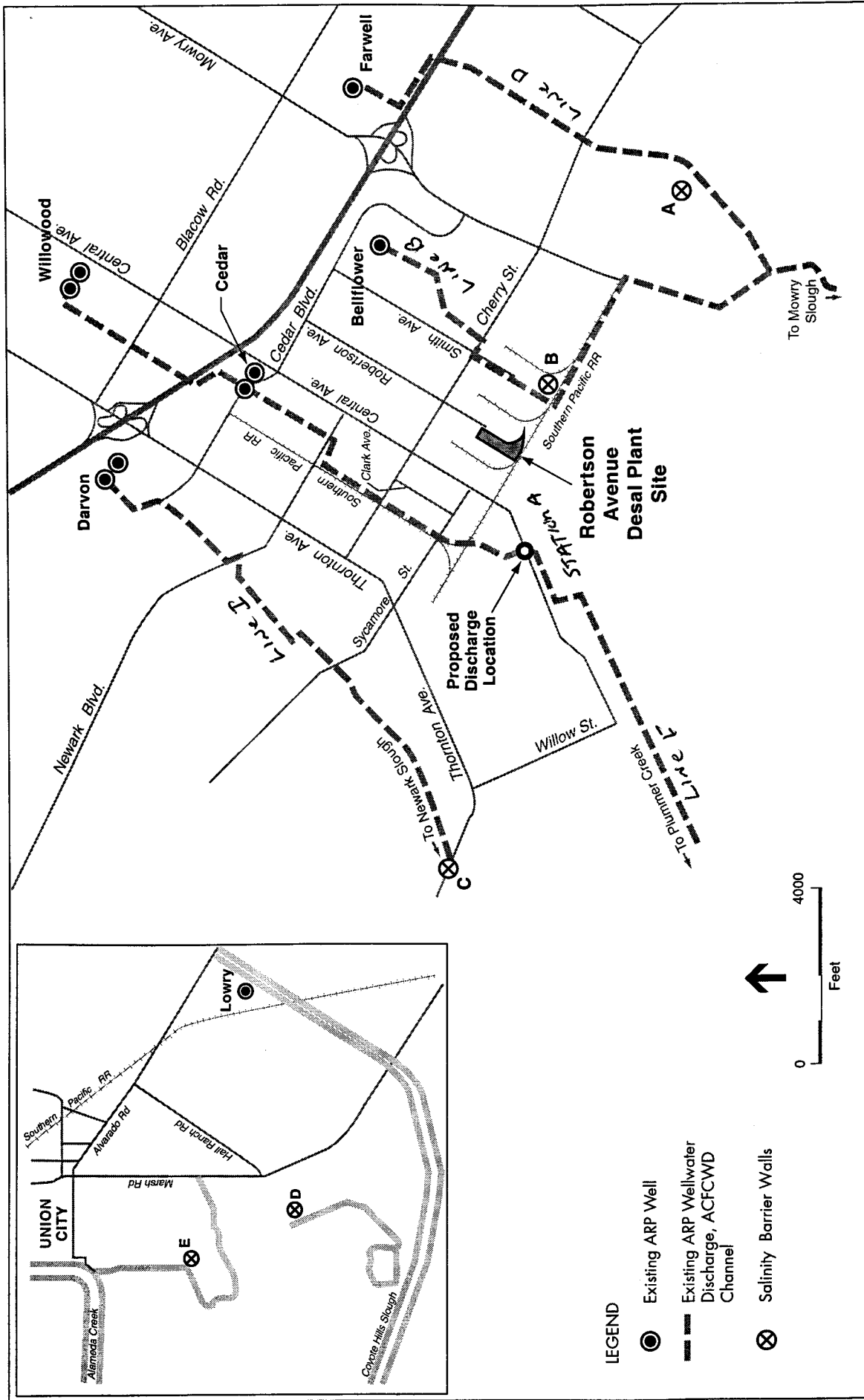
A handwritten signature in black ink, appearing to read 'L P Kolb', with a large, stylized initial 'L'.

Lawrence P. Kolb
Acting Executive Officer

Attachments:

Attachment A – Table and Location Map of the District Wells and Discharge Locations
Standard Provisions and Reporting Requirements – August 1993

ATTACHMENT A





SOURCE: Environmental Science Associates

ACWD Desal Plant Plan Study / 980284 ■
Proposed Facility Locations and
Sampling Locations

Effluent Stream No.	Well Name	Well Discharge Location at Flood Control Channel (Latitude and Longitude)	Status
E-01	Lowry	Alameda Creek Flood Control Channel (Lat. 37° 34' 43"; Long. 122° 03' 29")	Active
E-02	Cedar 1	Line F (tributary to Plummer Creek) (Lat. 37° 32' 22"; Long. 122° 01' 06")	Active
E-02	Cedar 2	(Lat. 37° 32' 22"; Long. 122° 01' 06")	Active
E-06	Willowood 1	(Lat. 37° 32' 60"; Long. 122° 00' 39")	Active
E-06	Willowood 2	(Lat. 37° 32' 60"; Long. 122° 00' 39")	Active
E-03	Bellflower	Lines B and D (tributary to Mowry Slough) (Lat. 37° 31' 47"; Long. 122° 00' 35")	Active
E-04	Farwell	(Lat. 37° 31' 57"; Long. 121° 59' 48")	Active
E-12	S.B.P. "B"	(Lat. 37° 31' 14"; Long. 122° 01' 10")	Inactive
E-13	S.B.P. "A"	(Lat. 37° 30' 50"; Long. 122° 00' 19")	Inactive
E-05	Darvon 1	Line I (tributary to Newark Slough) (Lat. 37° 32' 47"; Long. 122° 01' 28")	Active
E-05	Darvon 2	(Lat. 37° 32' 47"; Long. 122° 01' 28")	Active
E-10	SBP "C"	(Lat. 37° 31' 38"; Long. 122° 03' 21")	Inactive
E-07	SBP "E"	Alameda Creek Flood Control Channel (Lat. 37° 35' 06"; Long. 122° 05' 22")	Inactive
E-08	SBP "D"	Alameda Creek Flood Control Channel (Lat. 37° 34' 23"; Long. 122° 05' 01")	Inactive
E-09 & 11			Destroyed
E-14	Cedar 1 & Cedar 2 & Bellflower	Line F at Central Avenue (trib. to Plummer) (Desalination facility concentrate w/or w/o excess ARP well water) (Lat. 37° 31' 18"; Long. 122° 01' 56")	Desal & Alternate to E-02 & 03

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM
FOR
AQUIFER RECLAMATION/SALINITY BARRIER WELLS
AND DESALINATION FACILITY
ALAMEDA COUNTY WATER DISTRICT
FREMONT AND NEWARK, ALAMEDA COUNTY

NPDES NO. CA0038059
ORDER NO. 00-029

CONSISTING OF
PART A, DATED AUGUST 1993
AND PART B

PART B

I. DESCRIPTION OF SAMPLING STATIONS

Aquifer Wells

Each of the ARP/SBP effluent streams, E-01 through E-13 (E-09 and E-11 have been destroyed) shall be sampled at a point between each well and its point of discharge into an adjacent Alameda County Flood Control and Water Conservation District (ACFCWCD) flood control channel.

Desalination Facility

The concentrate from the desalination facility (E-14) shall be sampled at a point between the facility and the point of discharge into ACFCWCD Line F (located at Line F's intersection with Central Avenue) that includes any excess ARP well pumpage not being processed by the desalination facility.

Receiving Water Monitoring

- C-1: Approximately 100 feet upstream of the E-14 discharge point in Line F
- C-2: Approximately 1000 feet downstream of E-14
- C-3: Approximately 4,000 feet downstream of E-14 at the terminus of Line F
- C-4: Approximately 5,000 feet downstream from the terminus of Line F, within the tidally influenced area.

II. SCHEDULE OF SAMPLING, ANALYSIS AND OBSERVATIONS

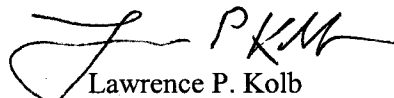
- A. The schedule of sampling, analysis and observation for the aquifer wells shall be that given in Table 1. The schedule of sampling, analysis, and observation for the desalination facility and receiving water shall be that given in Table 2.
- B. Sample collection, storage, and analyses shall be performed according to requirements in the latest 40 CFR 136, in the permit, or as approved by the Executive Officer.

III. MODIFICATIONS OF PART "A", DATED AUGUST 1993

- A. The following paragraphs of Part A are excluded: C.1., C.2. (except C.2.b), C.3., C.4.b., C.5., D.1., D.3., D.4., D.5., E.3., E.4., E.5., F.4.c, F.4.e.
- B. Part A, Paragraph F.4. shall be modified to: "Written reports shall be filed regularly for each calendar quarter by the fifteenth day of the month following the end of each calendar quarter..."
- C. Part A, Paragraph E.2a shall be modified to: "a. Total flow or volume for each month." Paragraph E.2b shall be modified to: "b. Average daily flows for each month.:"

I, Lawrence P. Kolb, Acting Executive Officer, hereby certify that this Self-Monitoring Program:

1. Has been developed in accordance with the procedures set forth in this Regional Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Regional Board Order No. 00-029
2. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the discharger, and revisions will be authorized by the Executive Officer.
3. Is effective on the date shown below.


Lawrence P. Kolb
Acting Executive Officer

Effective Date: April 19, 2000

Attachment:

A. Table 1 and Table 2

TABLE 1
SCHEDULE OF SAMPLING, MEASUREMENTS, AND ANALYSIS FOR AQUIFER WELLS

NPDES NO. CA0038059
ORDER NO. 00-029

ARP/SBP SAMPLING STATIONS	Stations E-1 to E-13
TYPE OF SAMPLES	Grab
Flow rate (mgd)	M
Acute Toxicity – 96 Hour (% survival) ¹	M
Total Dissolved Solids (mg/l)	M
pH (Units) ²	M
Temperature (°C) ²	M
Chlorides (mg/l)	M
Standard Observations ³	M

LEGEND:

E = ARP/SBP well effluent stations
M = One sample per month

NOTES:

- 1 Consistent with current effluent toxicity testing requirements (per Board letter dated November 4, 1991), compliance with the effluent toxicity requirement shall be determined by performing static percent survival bioassay non-renewal using three-spine stickleback. The discharger shall conduct the bioassay testing on two discharging wells every month. If possible, the bioassay testing shall be conducted on wells not tested during the previous quarter.
- 2 The physical characteristics of pH and temperature shall be determined using field instruments.
- 3 Standard Observations includes noting the presence or absence and the source of floating and suspended material of waste origin (such as oil, grease, algae, and other macroscopic particulate matter).

TABLE 2
SCHEDULE OF SAMPLING, MEASUREMENTS, AND ANALYSIS FOR DESALINATION
FACILITY DISCHARGE AND RECEIVING WATER MONITORING (A)

NPDES NO. CA0038059
ORDER NO. 00-029

SAMPLING STATIONS	E-14 – Desal Plant	C Stations – Receiving Water Monitoring
TYPE OF SAMPLES	Grab	Grab
Physical Parameters:		
Flow rate (mgd/cfs for E-14/C)	M	M
Tide Level	--	M
Acute Toxicity – 96 Hour (% survival) ¹	M	--
Total Dissolved Solids (mg/L)	M	M
Dissolved Oxygen (mg/L) ²	M	M
Chlorides (mg/L)	M	M
Conductivity ($\mu\text{S}/\text{cm}$) ²	M	M
pH ²	M	M
Temperature ($^{\circ}\text{C}$) ²	M	M
Salinity (ppt) ²	M	M
Metals ³ (Total):		
Arsenic	M	M
Cadmium	M	M
Chromium	M	M
Copper	M	M
Lead	M	M
Magnesium	M	M
Mercury	M	M
Nickel	M	M
Selenium	M	M
Silver	M	M
Zinc	M	M

LEGEND:

- A = The District will conduct a special water quality monitoring program during the first year following Desalination Facility startup to document that concentrate quality and ambient water quality in Line F and Plummer Creek are not significantly different from the levels predicted based on pilot plant results and as measured in predischARGE receiving water quality monitoring. If the first year special study results confirm no statistically significant differences between the observed and the projected water quality

concentrations previously shown to be protective of beneficial uses, the Executive Officer may suspend additional receiving water monitoring until there is evidence from on-going discharge monitoring that concentrate quality has significantly changed. Sampling of blended/unblended desalination plant effluent at E-14 will continue on a monthly basis, consistent with existing ARP well sampling.

- M = One monthly sampling period consisting of two grab samples taken on the same day for each sampling location. The two samples shall be taken according to the tides, with one low tide (low or lower low) and one high tide (high or higher high) sample. The high and low tide samples shall not be composited for each sampling location but individually analyzed. However, tidally averaged values shall also be calculated and reported.

NOTES:

- 1 Compliance with the effluent toxicity requirement shall be determined by performing static percent survival bioassay renewal (using a new 24-hour sample for each day of the four-day test) using two test species. One shall be three-spine stickleback, and other shall be either rainbow trout or fathead minnow. The discharger shall conduct the bioassay testing every month the desalination facility is operating for the concentrate discharge (E-14) from the facility. The Executive Officer may consider dropping the static renewal and the two test species requirements to a 96-hour static non-renewal test using one test species one year after the effective date.
- 2 The physical characteristics of dissolved oxygen, conductivity, pH, temperature, and salinity shall be determined using field instrumentation.
- 3 Metals analyses shall be conducted using analytical methodologies that minimize interferences due to elevated receiving water or concentrate salinity concentrations.